SM 4: Using a PAD to Find Sampling Sites and Record Data

During the 2016 Monarch Monitoring Trial, a personal accessory device (PAD or iPad) will be used to locate sampling sites, take photographs, and record data. Use of the iPad will require access to a web-based geospatial viewer (ArcGIS on-line or AGOL) produced by ESRI, and two installed applications: Collector and Survey123. This document supplements SOP 5 on data management and explains how to gain access to AGOL, download previously established spatial data, navigate with the iPad to data collection sites, and record and save those data.

Topic Directory

Click on one of the topics listed below to get related instructions:

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- FWS (i.e., @fws.gov email)
- Collaborators

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- Lightning Plug
- GPS Pro (Bluetooth)

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- Download Map onto your Device
- Map Quick Reference
- Adding Photos of Plot Corners
- Adding Road Plot Corners
- Submitting Additions/Edits

Monarch Inventory Feature Service
- Point Feature Classes
- Polygon Feature Class

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- Download Surveys
- Complete and Submit Surveys
- Viewing Submitted Data
- Exporting the Survey Data

ArcGIS Online (AGOL) Sign Up

Please note that the FWS is retiring the old accounts created from the Google form. For example, "richard_easterbrook_fws", is no longer a valid account. Follow the steps below to Sign up for a new account if you do not already have one.

FWS Staff (i.e., @fws.gov email) Only—

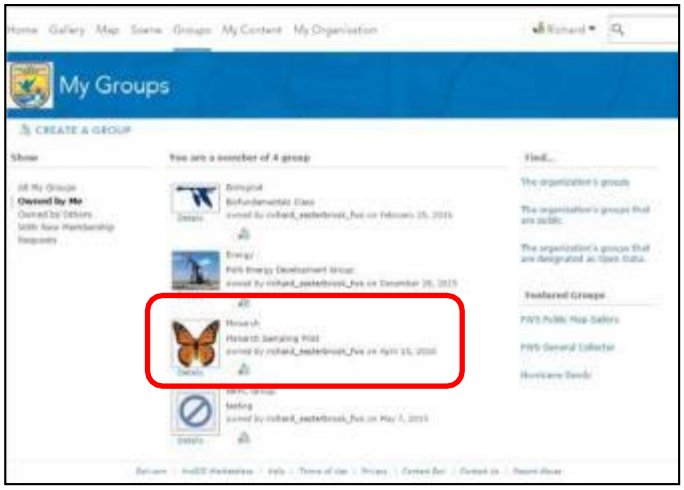
1. Go to http://fws.maps.arcgis.com/home/.
2. Select "Sign In" in the upper right-hand corner.
3. Select "Using your U.S. Fish and Wildlife Service Account" option. You will automatically be logged into AGOL using single sign-on (SAML).
    - Your user name is your FWS email address with "_fws" added to the end (e.g., richard_easterbrook@fws.gov_fws).
    - Your password is your FWS active directory password.

4. Fill-out the Google form, link below, to receive "Publisher" permissions to AGOL. https://docs.google.com/a/fws.gov/forms/d/1vA7FrKIb3QgpRc6qlm958a21M4OHQgQyPXVy40FLaNc/viewform

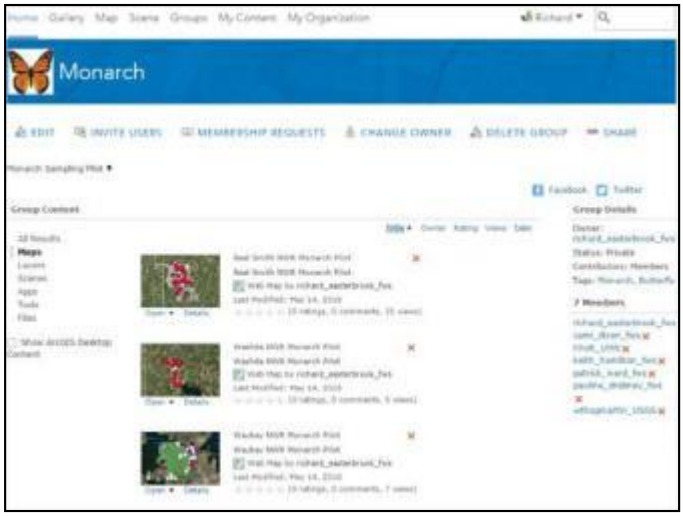
Collaborators Only—

1. Existing AGOL accounts with another Organization (e.g., University) will work. Ensure your visibility is set to Everyone (public), so I (Richard Easterbrook) can locate the account and add you to the Monarch Group.
2. **Collaborator** - A FWS employee must sponsor a collaborator (non-FWS staff) by entering information into the Google form, link below, in order to have a collaborator account created. Collaborators will only be able to join Organizational Groups, edit existing features, and share within the organization. https://docs.google.com/a/fws.gov/forms/d/1vA7FrKIb3QgpRc6qlm958a21M4OHQgQyPXVy40FLaNc/viewform
3. Go to http://fws.maps.arcgis.com/home/.
4. Select "Sign In" in the upper right-hand corner.
5. Select "Using your ARCGIS Account" option.

6. Click on the 'Monarch' Group.



7. The content shared with this AGOL Group (i.e., Web Maps and Feature Layers) is displayed. The image below shows just the Web Maps in the 'Monarch' Group. These maps can be opened in either the AGOL map viewer or ArcGIS on Desktop.



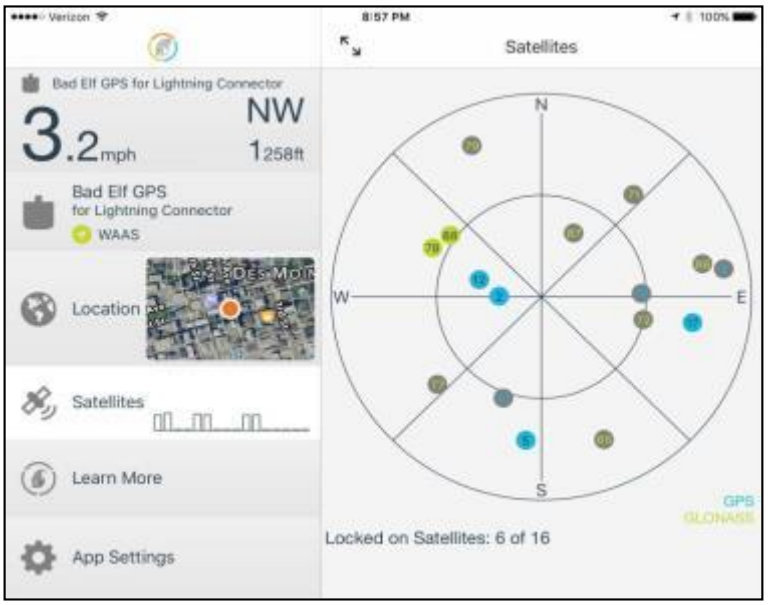
Bad Elf GPS

PADS with cellular plans have built-in GPS units. PADS which are only able to connect to the internet through Wi-Fi do not. These PADS require an external GPS unit to be able to navigate and record locations.

Lightning Plug—

1. Plug the GPS unit into the Lightning port. Please note that these GPS units come with an adapter so they'll fit while the PAD is in its Lifeproof case. **Take special care not to loose this small adapter.**

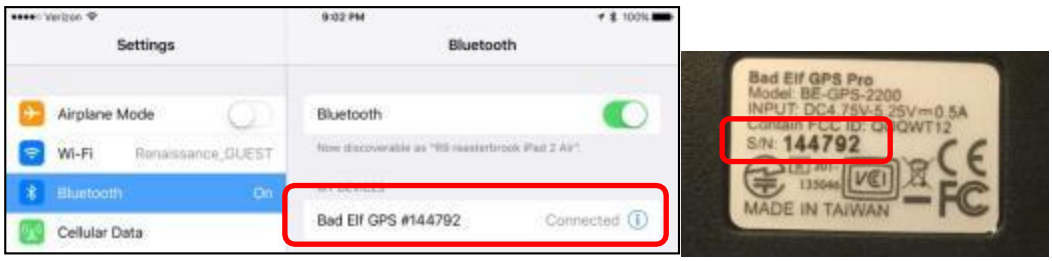
2. Open the Bad Elf app. and verify that the unit is recognized and satellites are being tracked; see image below. Depending on your location on the earth and proximity to buildings/tall objects, the iPad may take up to 5 minutes to be recognized and begin tracking satellites. The iPad cannot be used if the Bad Elf unit is not working. If it appears the unit is not being tracked , remove and then plug the lightning plug back in and restart the process.



GPS Pro (Bluetooth)—

1. Turn on the GPS unit by pressing the **Power Button**.
2. Pair the iPad with the Bad Elf GPS Pro; see images below.
   a. Turn on the iPad's Bluetooth option
   b. Settings
   c. Bluetooth – Ensure that Bluetooth is turned-on and paired with the correct device
3. Accept the pairing on the GPS unit.
4. Open the Bad Elf app, and verify that the Bad Elf unit is recognized and satellites are being tracked; see image above. Depending on your location on the earth and proximity to buildings/tall objects, the iPad may take up to 5 minutes to be recognized and begin

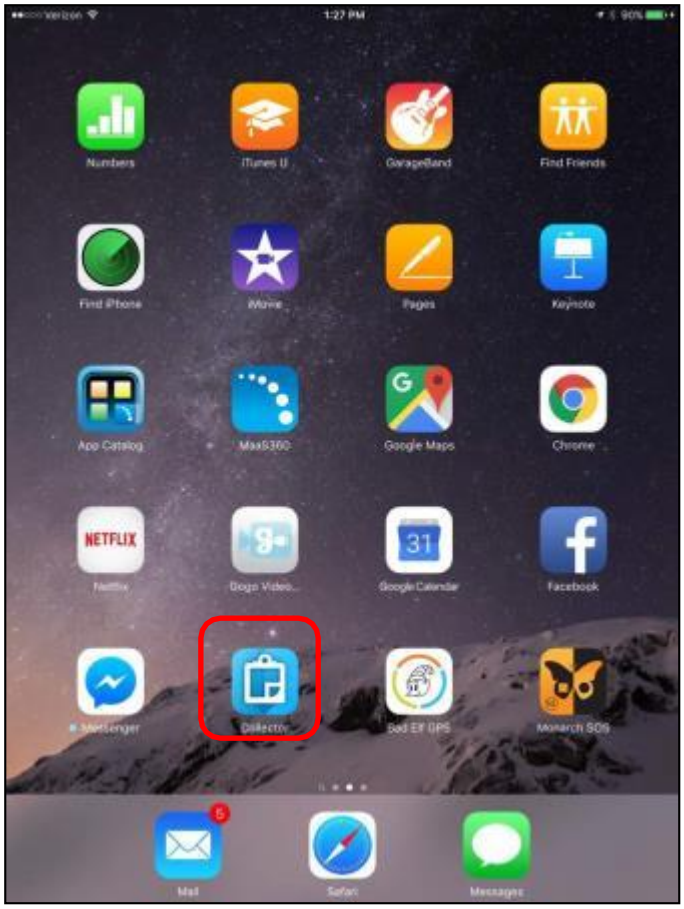
tracking satellites. The iPad cannot be used if the Bad Elf unit is not working. Ensure that steps 1-3 above were followed.



ESRI Collector Application

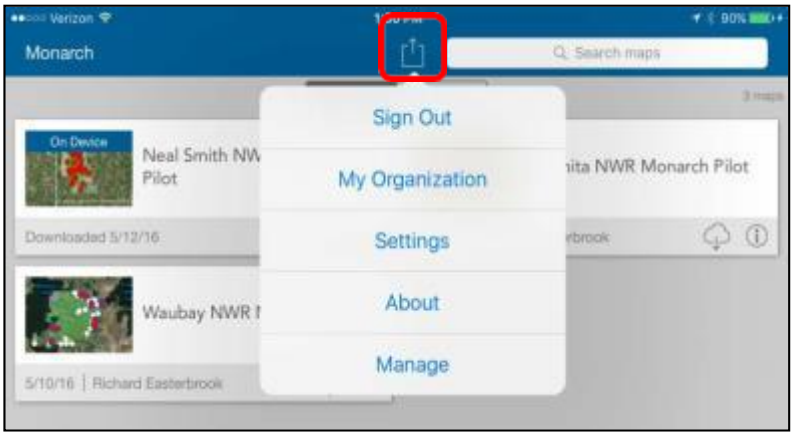
Collector—

1. Open the Collector application.



2. Log on using your FWS AGOL (or other AGOL Organization) provided credentials.

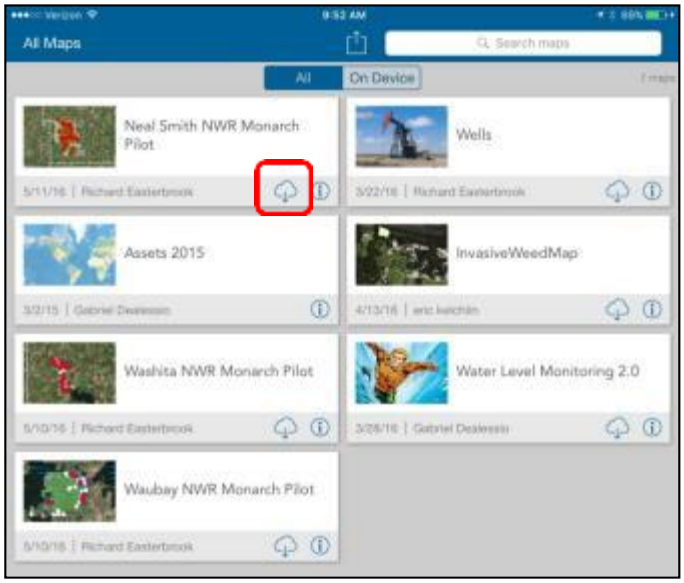
Menu Quick Reference Guide—



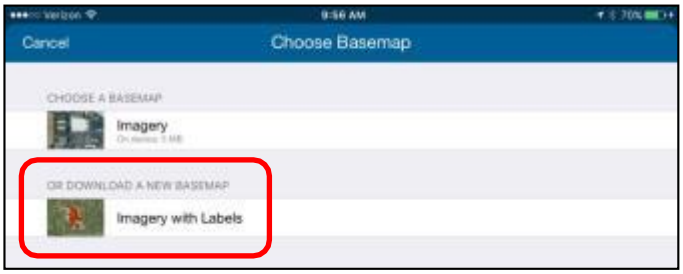
1. **Sign Out** – Sign out of Collector
2. **My Organization** – Provides your ArcGIS Online Organization information
3. **Settings** – Collector application settings
   a. Units of Measurement
      - Imperial
      - Metric
   b. Map Download and Sync
      - WiFi Only
      - WiFi or Cellular
   c. Collection Style
      - Single
      - Continuous
   d. Collection Options
      - Filter Related Types
   e. Navigation and directions
      - Use Navigator for ArcGIS
   f. Preferred Attachment Size
      - Actual (Full)
      - Small
      - Medium
      - Large
      - Extra Large
   g. Synchronization
      - Push/Pull
      - Push Only
4. **About** – Information about the Collector application on the device
5. **Manage** – Mange (remove) the maps and basemaps loaded on the device

Download a Map onto your Device—The Collector application is usable in a disconnected environment (i.e., no cell service or WiFi). This requires that a local copy of the AGOL map be downloaded onto the device (e.g., iPad). This should be done initially and anytime you want to see 'others' content after syncing with AGOL.

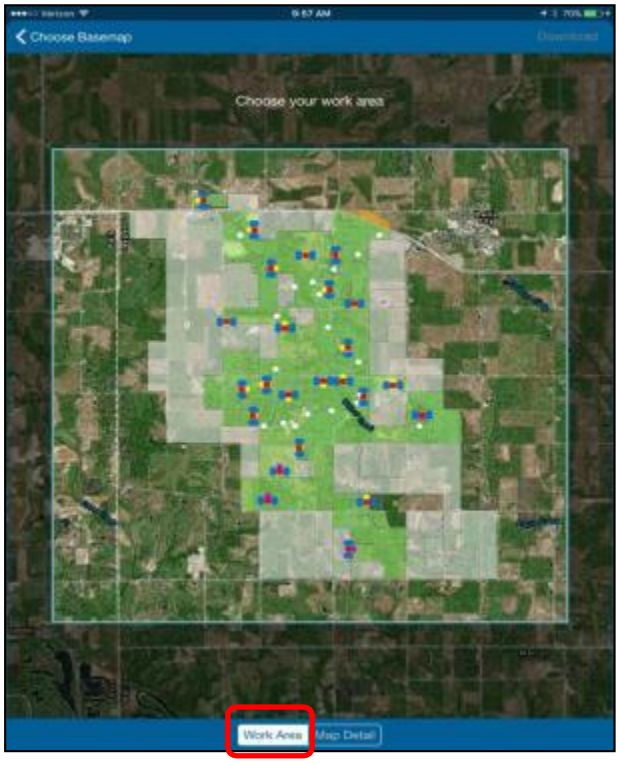
1. Select the download button on the 'NWR Monarch Pilot' map.



2. Choose a Basemap. If this is the first time downloading this map, then choose the 'or Download a New Basemap' option. If the basemap is already on the device, then choose the existing basemap.

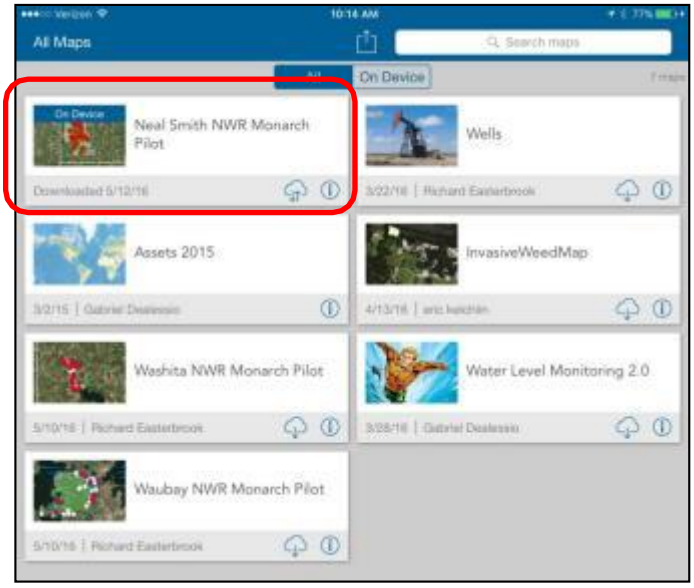


3. Select the **Work Area** tab and zoom in and out on the area to be downloaded. It is not necessary to have the whole refuge in the work area. The user can download only that portion of the map in which they will be working.



4. Select the **Map Detail** tab and zoom in and out to select the scale/detail of the map downloaded. The Map Detail tab only controls the level of detail at which can be seen on the map. The whole Work Area will be downloaded. Pay special attention to the estimated size of the download. If the file size is too large (> 200 mB) and/or the WiFi/cellular service is poor, map download may fail or take a very long time.

5. Select Download in the upper right-hand corner of the app. Once complete you'll see that the map is now On Device.



6. Open the map on the device.

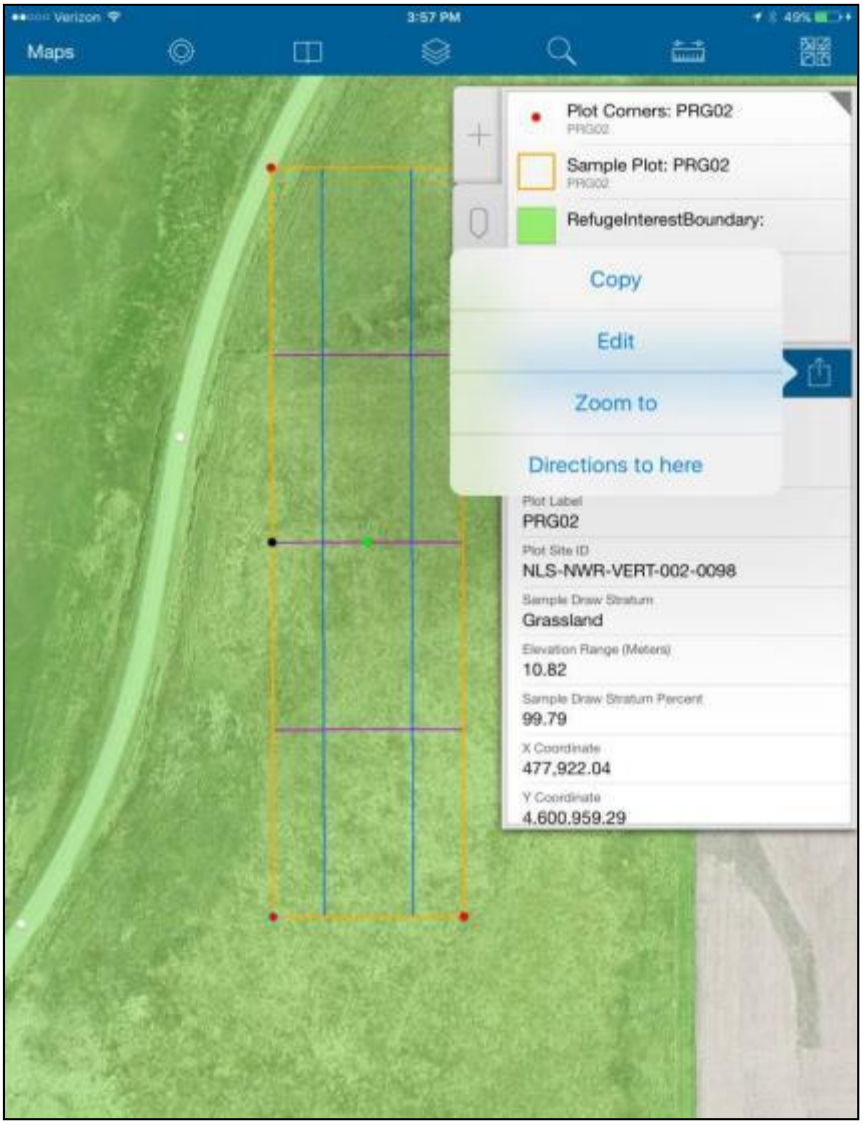
Map Quick Reference—

1. **Maps** – Goes to the **Map Gallery**.
2. **My Location** tool - Uses your device's GPS to show your location on the map. The icon changes to show the state of the GPS. The ○ icon indicates that your location does not display on the map. Once your location is turned on, the ◉ icon indicates your location displays on the map and is kept centered. As you move, the map moves on the screen to keep your location centered on the screen. Once you pan the map while your location is displayed, the ◎ icon indicates that your location is displayed on the map but isn't kept centered. As you move, your location displayed on the map moves on the screen and can even move outside the visible part of the map.
   - *When you don't need to see your location on the map, **turn off 'My Location'**. This saves the battery by turning off not just the display of your location, but also the GPS. If the map tracks your location, it continues to do so when location is not displayed on the map, turning on the GPS when needed. If you're collecting data, the GPS turns back on as needed to get collection locations.*
3. **Bookmarks** tool - Goes to previously defined areas of interest. These include **Bookmarks** defined on the map and **My Places** that you've stored in your device.
4. **Layers** tool - Displays the layers in the map and allows you to turn features on and off. While this changes which features are visible and display on the map, it doesn't change the data in the map, or change the map as it's viewed by other users.
5. **Search** tool - Searches for a place-name, address, coordinate location, or feature.
6. **Measure** tool - Draws lines and shapes on the map, and calculates their lengths and areas in a variety of measurement units.
7. **Basemaps** tool - Changes the basemap to another one that is either online or on your device. The basemap, also called a reference or background map, provides the information displayed under the interactive features.
8. **Map** - The map appears here, including a basemap and features. You can pan, zoom in, and zoom out to see other areas.
9. **Collect New** tool – **Adds a feature**.

For more information, please refer to: https://doc.arcgis.com/en/collector/ios/collect-data/quick-reference.htm.

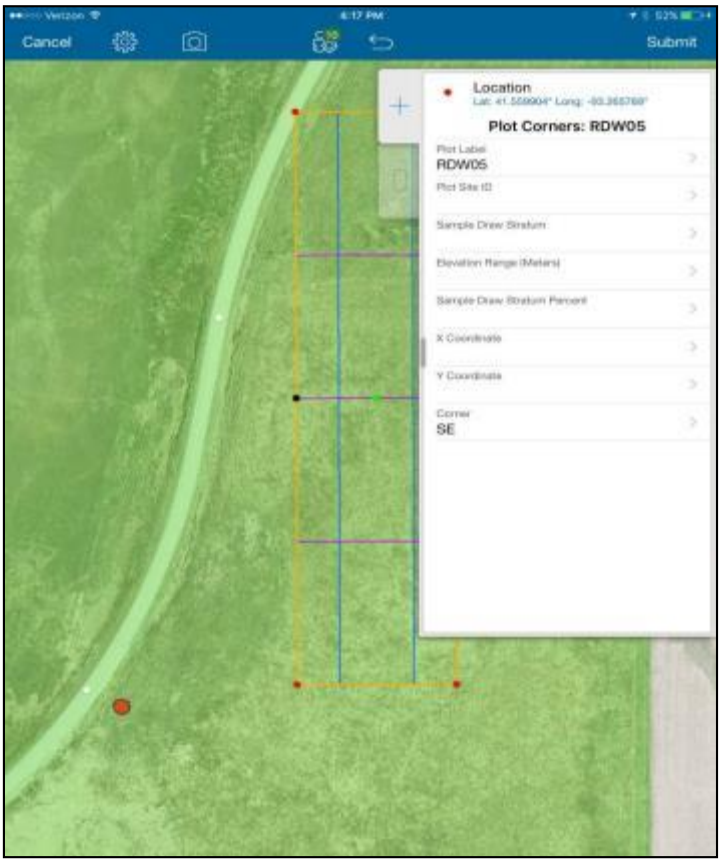
Adding Photos of Plot Corners—

1. Select a plot corner point on the map by tapping it. The menu will appear.
2. Tap the **Menu** icon just right of **Details** and select **Edit**.
3. Tap on the Attachments icon.
4. Tap **Add**, and then select **Take Photo or Video**. Take a photo with the iPad and then select **Use Photo** in the lower right-hand corner.
5. Tap on **Done**. ***Please only add one photograph per plot corner***.
6. Tap on **Update** to submit the photo attachment.



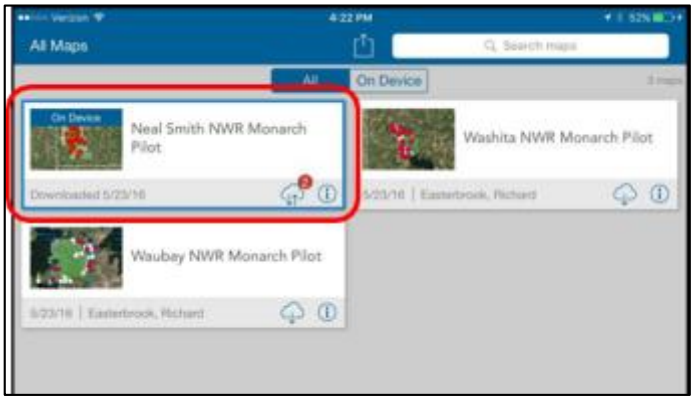
Adding Road Plot Corners—

1. Tap the **Collect New** icon .
2. Select **Plot Corners** from the menu.
3. The new Plot Corner will be placed at the current GPS position.
4. Fill-out the **Plot Label** (from the Sample Draw feature class) and **Corner** fields (i.e., NW, NW, SE, SW)
5. Tap on **Submit**.



Submitting Additions/Edits—

1. The **All Maps** window will display any additions/edits that need to be synced, using a red number, over the Sync icon .
2. Tap on the Sync icon to move you changes into AGOL.



Monarch Inventory Feature Service

Point Feature Classes—Each dark bullet below represents a layer of information in the map which can be turned on & off. The white, sub-bullets list the features/information available for each point within a layer of information.

- **Plot Centroid (PlotCent)** – Center of Sample Plot
  - PlotLabel – Refuge Plot Label
  - PlotSiteID – Unique Site ID
  - SdStratum – Sample Draw Stratum
  - ElevRange – Elevation Range (Meters)
  - SdStratPct – Sample Draw Stratum Percent
  - Xcoord – UTM X Coordinate
  - Ycoord – UTM Y Coordinate
  - NVC_MACRO – NVC Macro
  - ECOLSYS_LU – NVC Ecological System
  - GlobalID – GUID
- **Plot Corners (PlotCorner)** – Corner Points of Sample plot
  - PlotLabel – Refuge Plot Label
  - PlotSiteID – Unique Site ID
  - SdStratum – Sample Draw Stratum
  - ElevRange – Elevation Range (Meters)
  - SdStratPct – Sample Draw Stratum Percent
  - Xcoord – UTM X Coordinate
  - Ycoord – UTM Y Coordinate
  - Corner – Corner Identifier
- **Sample Draw (SampDraw)** – USGS Sample Draw Point
  - PlotSiteID – Unique Site ID
  - Xcoord – UTM X Coordinate
  - Ycoord – UTM Y Coordinate
  - SdStratum – Sample Draw Stratum
  - PlotLabel – Refuge Plot Label
  - GlobalID – GUID
- **20 Meter Transect** – 20 Meter Transect Lines
  - PlotLabel – Refuge Plot Label
  - PlotSiteID – Unique Plot Site ID
- **75 meter Transect** – 75 Meter Transect Lines
  - PlotLabel – Refuge Plot Label
  - PlotSiteID – Unique Plot Site ID
- **Rapid Assessment Design Line** – 20 Meter Rapid Assessment Design Line
  - PlotLabel – Refuge Plot Label
  - PlotSiteID – Unique Plot Site ID

Polygon Feature Class—

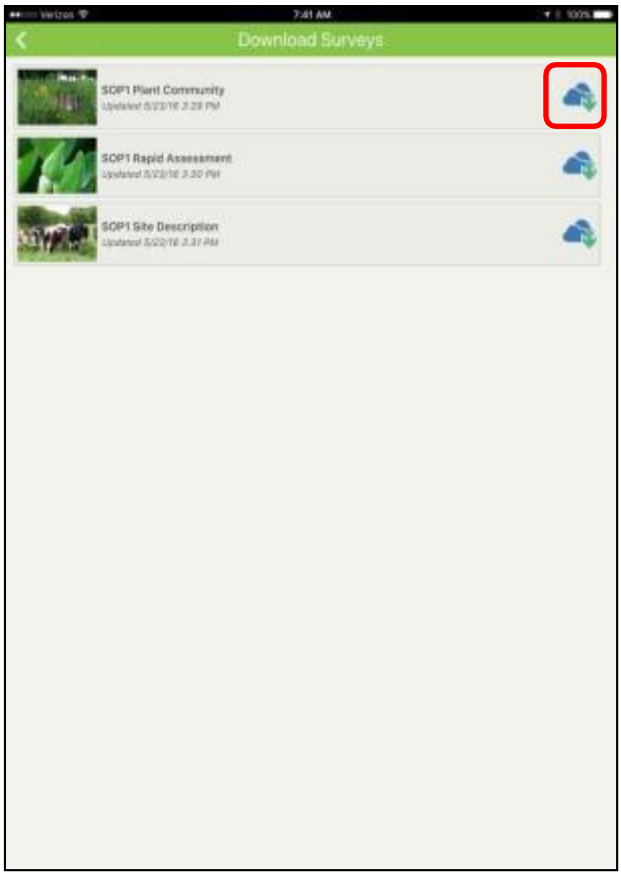
- **Sample Plot (Plot)** – 75-meter x 300-meter Sample Plot
  - PlotLabel – Refuge Plot Label
  - PlotSiteID – Unique Plot Site ID
  - SdStratum – Sample Draw Stratum
  - ElevRange – Elevation Range (Meters)
  - SdStratPct – Sample Draw Stratum Percent
  - SHAPE_Length - Length
  - SHAPE_Area – Area

Survey123

The Survey123 application by ESRI will be used to digitally record data collected in the field. Similar to the Collector app, users will download a local copy of survey(s) while they have either WiFi or cell service, fill-out the survey on the iPad while in the field, and then submit the information when they have service coverage. For more information on Survey123, please visit http://doc.arcgis.com/en/survey123/.

Download Surveys—

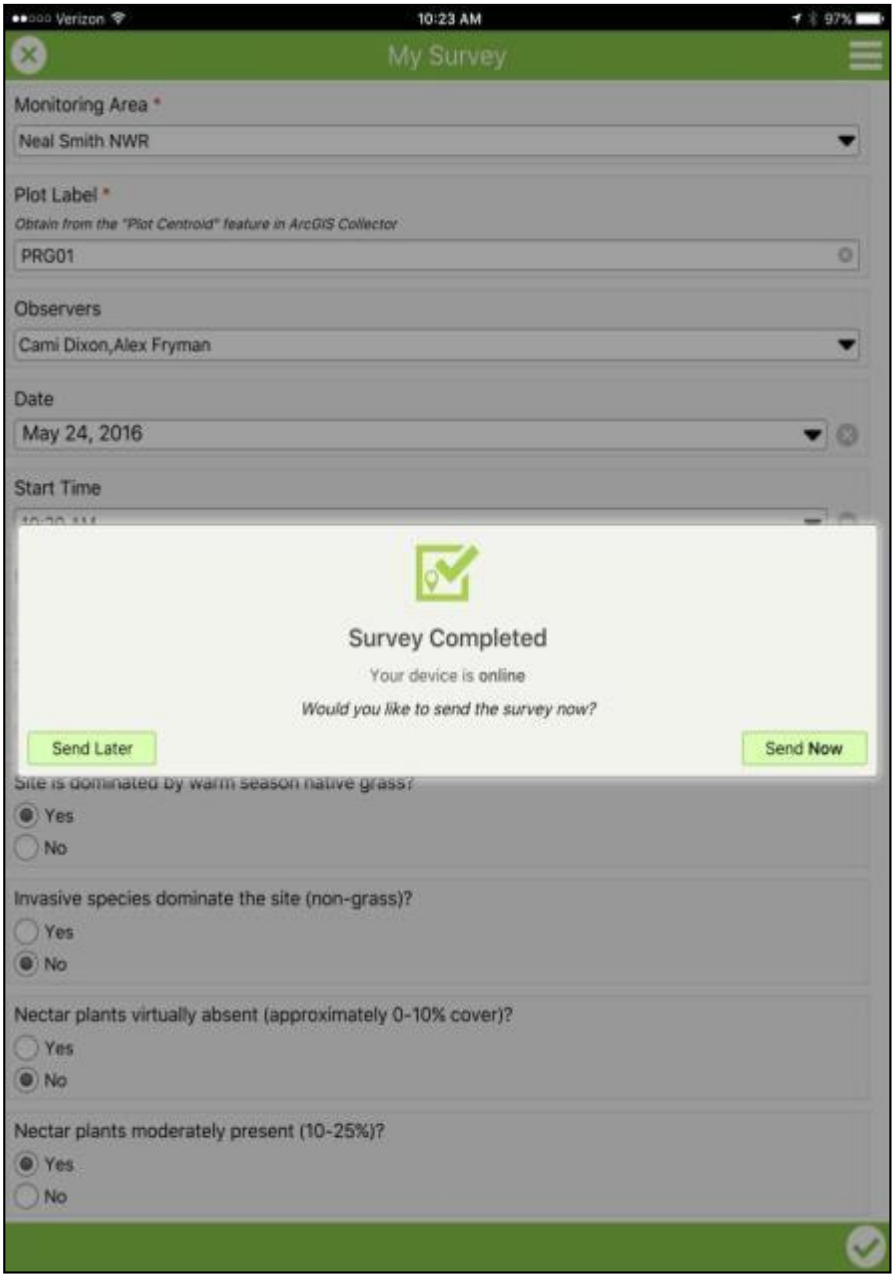
1. Open the Survey123 application.
2. Sign in using your AGOL user name and password.
3. Select the surveys to download from those available in the **Download Surveys** window by tapping on the **Download** icon . Choosing the Refresh icon on an already downloaded survey will replace the locally-saved survey with the latest update.



Complete and Submit Surveys—

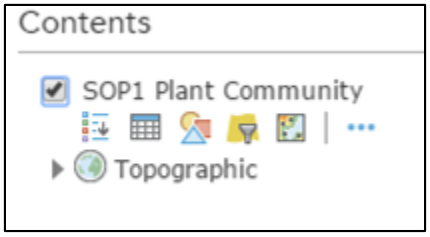
1. Select the back arrow to return to the **My Surveys** gallery on the device.

2. Select any of the downloaded surveys to open it.
3. Tap on **Collect** to start entering information into the survey.
4. Once complete, submit the survey by tapping on the check mark in the lower right-hand corner of the application.
   - Select **Send Later** if the survey is not complete (e.g., End Time is not filled-out) or if there is no WiFi or cellular service. This survey will remain in the **Outbox** until submitted. **<u>These updates must be manually submitted.</u>**
   - Select **Send Now** to submit the survey to AGOL.


Verizon
10:23 AM
97%
My Survey
Monitoring Area *
Neal Smith NWR
Plot Label *
Obtain from the "Plot Centroid" feature in ArcGIS Collector
PRG01
Observers
Cami Dixon,Alex Fryman
Date
May 24, 2016
Start Time
Survey Completed
Your device is online
Would you like to send the survey now?
Send Later
Send Now
Site is dominated by warm season native grass?
Yes
No
Invasive species dominate the site (non-grass)?
Yes
No
Nectar plants virtually absent (approximately 0-10% cover)?
Yes
No
Nectar plants moderately present (10-25%)?
Yes
No

Viewing Submitted Data— All of the data collected using the Survey123 and Collector application in the field using the iPads can be viewed in ArcGIS Online.

1. Sign In to AGOL (http://fws.maps.arcgis.com/home/) using you FWS Enterprise Account.
2. Go to the "Groups" menu item and you'll see the "Monarch" Group. This Group contains the maps, surveys and feature layers.
3. Open any of the Feature Layers (Feature Layers are indicated by this image) for the surveys (e.g. SOP1 Site Description) by clicking on the survey's image.
4. Hover your mouse over the survey's name in the Contents table on the left side of the screen to reveal the survey's options; see figure below.



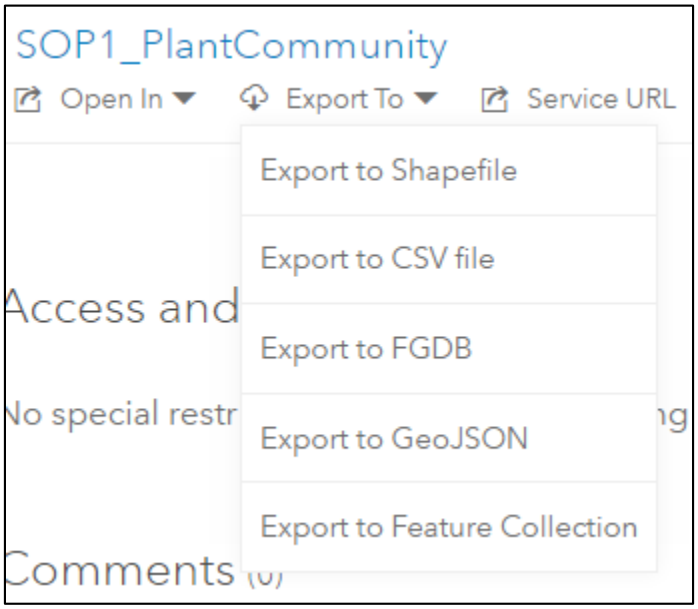
5. Select the option to Show Table .
6. By dragging the map (click and drag) and zooming in (mouse wheel) to specific points, you can select an individual point's survey attributes to be highlighted; see image below.

It is important not to attempt to manipulate the data in this format/from this screen. If a point/survey field is selected and deleted, THERE IS NO WAY TO RECOVER THE DATA. Instead, you can export the data into a text or an Excel spreadsheet file.

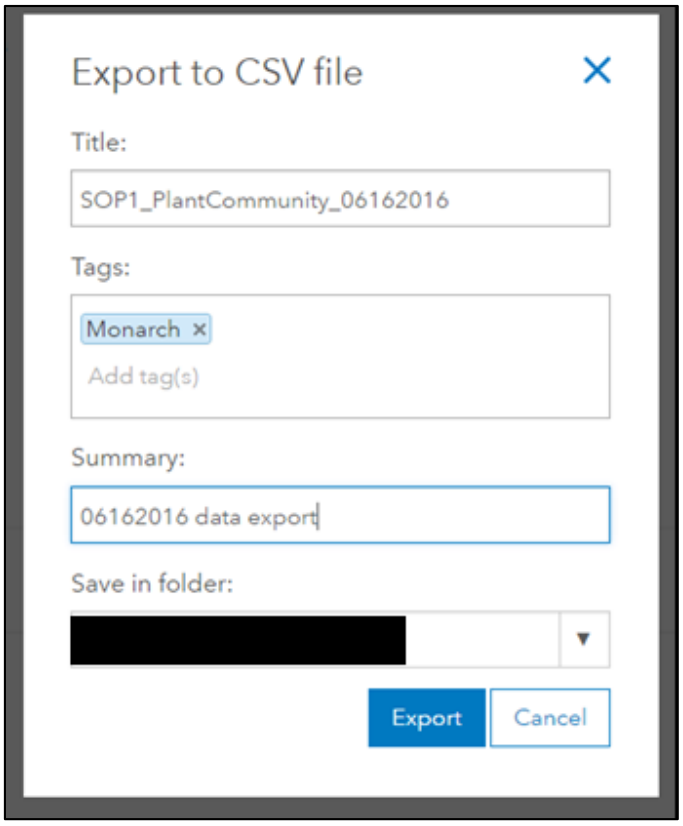
Exporting the Survey Data—From the Monarch Group home page:

1. Select the 'Details' option from below the image of the survey feature layer's data you want to export.

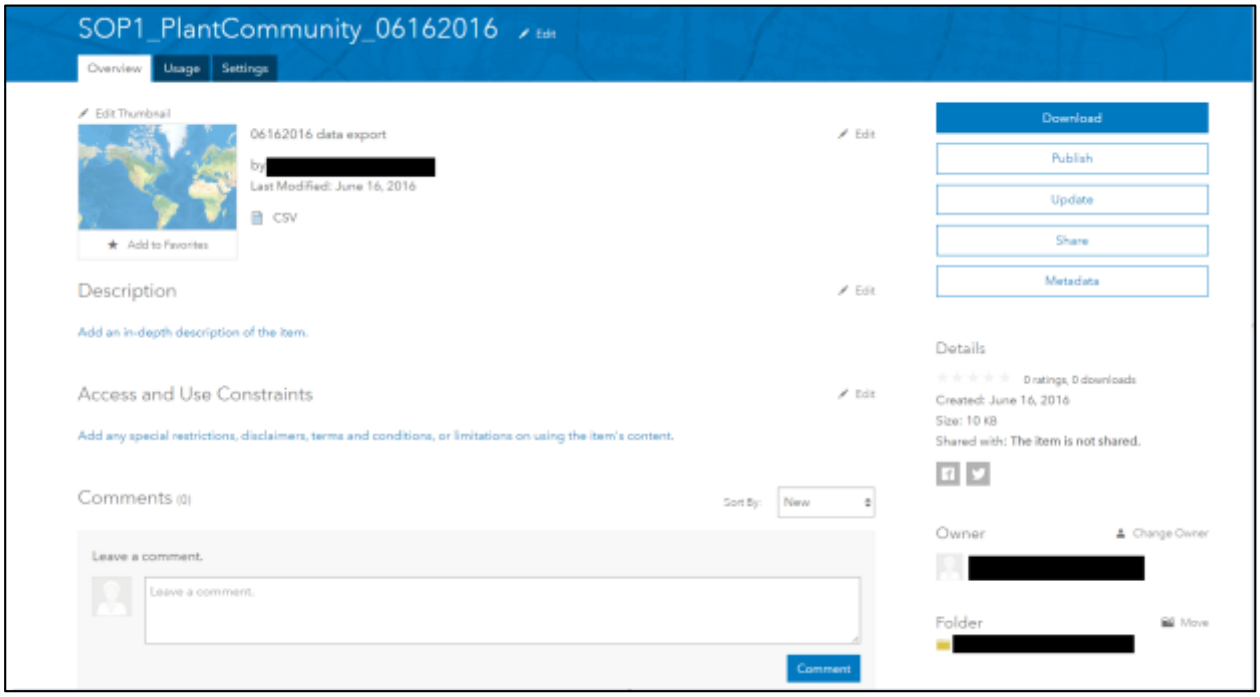
2. Select the format you want the exported data in from the 'Export To' dropdown menu; CSV to open the data in Excel.



3. Fill out the *Title*, *Tags*, and *Summary* fields in the window that pops up; *Tags* are keywords which can be used to quickly locate the exported data in the future. Each field must have an entry to be able to export the data. Select 'Export' when ready.



4. Once the export is complete, you will automatically be taken to the exported data's page in your content.



    a. All exported data will be moved to your content and stored for future use. In the future, the exported data can be found by selecting ‘My Content’ from the menu bar at the top of the page.
5. To download the exported data, select the blue ‘Download’ button in the upper right-hand corner of the screen.